Comparative study on conductivity using polarization and depolarization current (PDC) test

Abstract :

Polarization and Depolarization Current (PDC) testing is a non-destructive dielectric testing method to determine the conductivity of insulations. It is one of the dielectric diagnostic techniques based on time domain measurement. PDC measurement technique has gained immense popularity due to its ability to assess the condition of HV insulation. PDC measurement can provide information about the conductivity within the initial periods (seconds) after a DC step voltage application. This paper present the review and comparison results from several published papers on application of PDC method in finding the conductivity of the various types of insulators. The scope of the review covered solid and liquid insulations types. In this paper, for solid insulation the studied was focused on cables insulations, electric machine stator insulation and paper insulator in power transformer insulation. For liquid insulation, the review and comparison was done on the biodegradable and mineral transformer oils. MATLAB software was used to simulate the conductivity level of the several types of HV insulation material. The conductivity level of insulation was found dependent on difference between the polarization and depolarization current values of the insulation material. The review results show that the PDC technique successfully give indication on level of conductivity of the HV insulation materials.